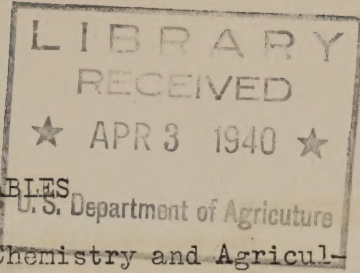


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March 22, 1940 RESEARCH IN FROZEN FRUITS AND VEGETABLES

An interview between H. C. Diehl, Bureau of Chemistry and Agricultural Engineering, and Wallace L. Kadderly, Radio Service, broadcast Friday, March 22, 1940, in the Department of Agriculture's portion of the National Farm and Home Hour over 92 stations associated with the National Broadcasting Company's Blue Network.

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KADDERLY:

H. C. Diehl is meeting with us again today. He's the man who is in charge of the Department of Agriculture's Frozen Pack Laboratory at Seattle. You may remember that Mr. Diehl was with us in January and at that time gave us a glimpse into the future of frozen foods. Today he's going to talk about the past and present of this new and growing industry.

Mr. Diehl, we'd like you to tell us in particular about your research in frozen fruits and vegetables. How did you happen to get into this frozen food study?

DIEHL:

A tremendous strawberry crop in the Northwest in 1923 began it -- the big crop and a call to the Department of Agriculture for help from the growers out there. Their berries were literally flooding the cold storage plants. You see, they were raising berries for cold pack. The processors put these berries with sugar in 50-gallon barrels and set them in a cold room to freeze.

KADDERLY:

What was the market for these bulk-frozen berries?

DIEHL:

They sold to manufacturers of jam and ice cream and soda fountain supplies. In the twenties this cold packing of berries for the wholesalers was a thriving industry in the Northwest.

KADDERLY:

But the cold storage plants couldn't take care of the big crop of berries in '23.

DIEHL:

That was the situation. Berries came into one plant at the rate of almost a thousand barrels a night. The plants just simply couldn't freeze them fast enough.

KADDERLY:

I suppose a lot of the fruit spoiled.

DIEHL:

And how! Some of those barrels fermented and burst. In one warehouse you could wade ankle-deep in a pool of strawberries.

(over)



KADDERLY:

So the Department of Agriculture sent you out to help the growers and packers on the problem.

DIEHL:

Yes, I went out in '24 to find a faster way to freeze berries in barrels and a better way to handle them. I worked on that job several years. Around that time some of the packers were getting interested in freezing fruit for retail trade. So we began trying out freezing in cans, cartons, or other containers. In '29 we put up a large pack -- something like 50 or 60 thousand containers of different fruits packed in different ways and frozen at different temperatures.

KADDERLY:

That was a landmark in frozen food research, I'd say.

DIEHL:

You might call it that. This pack showed what a wide variety of products would freeze successfully in small containers. It showed new possibilities of freezing for retail trade, and a new market for the growers.

KADDERLY:

So that's what started all your frozen-fruit investigations -- strawberries in barrels. When did you begin investigating frozen vegetables?

DIEHL:

In '29 ---- but we went at it very quietly and cautiously. Vegetables were more of a freezing-problem than fruit. We had temperature and spoilage to consider. Freezing doesn't sterilize. We knew the canners had had serious problems with spoilage of vegetables years before. We weren't sure how safely frozen peas, let's say, would keep.

KADDERLY:

I suppose you began your study with peas because they grow so well in the cool mild climate of the Northwest.

DIEHL:

Yes, we knew what it would mean to growers if peas would freeze successfully. But we didn't guess that within a few years peas for freezing would be growing on acres and acres of idle land or pasture in the Northwest. Nowadays the same man who raises peas feeds his dairy cattle on the waste pods and vines turned back at the freezing plant.

KADDERLY:

That's certainly getting full use out of a crop. But tell me. How did your first experiments in freezing peas turn out?

DIEHL:

I'll be frank and say they gave us a surprise. But they led to a valuable discovery. Some weeks after we put our first pack of peas in frozen storage we found them losing color and taking on a strange odor.



KADDERLY:

Spoilage?

DIEHL:

No, it wasn't spoilage. Our bacteriological tests proved that. We finally realized the peas were just continuing some of their life activity even while frozen. So our next job was to discover how to stop this activity in the peas before freezing yet not destroy the freshness.

KADDERLY:

Well, you evidently solved that problem --- but how did you do it?

DIEHL:

We and some other investigators found that a quick bath in hot water stopped the activity and, fortunately, also made the color deeper.

KADDERLY:

So that's why frozen peas always look so nice and green. Do all vegetables need the steam or hot water-bath before freezing?

DIEHL:

Most of them do.

KADDERLY:

Lucky for the growers and the industry somebody hit on this hot-water idea. Otherwise no one would be eating frozen vegetables today.

Now, let's go back a bit. You said temperature was one of your early problems in freezing.

DIEHL:

It was and still is. We still have more to learn about temperature. Some day we may discover a perfect freezing temperature for each variety of fruit and vegetable. But already we've learned a good deal. A most important early discovery was that a temperature far below zero is not necessary for freezing most products---if you have an efficient freezing process.

KADDERLY:

You mean the temperature necessary for quick freezing depends a good deal on how fast you can take the heat out of the vegetable or fruit.

DIEHL:

That's it. And that's why we worked to develop a method such as the one where peas are put loose on a belt, carried through the freezing tunnel, and packaged after freezing. Other methods accomplish the same thing in other ways. With a freezing process like that you need a temperature of only zero or a little below zero. Packers have told me this fact about temperature has saved them thousands of dollars in cost of electricity and equipment.



KADDERLY:

That discovery must have helped the young industry grow. Now, as I remember, Mr. Diehl, the Department established its Frozen Pack Laboratory in Seattle in 1931. Tell us some of the freezing jobs the laboratory has been working on since then. What about varieties for freezing for instance.

DIEHL:

With the help of Federal and State plant scientists we've been testing many varieties of both fruits and vegetables to see which freeze best. So now growers can know which variety to plant for freezing. We've also worked on the proper stage of ripeness for freezing, so growers can know exactly when to harvest their crops. And we've developed methods of harvesting and handling so crops come to the plant in best condition.

KADDERLY:

And now I understand you are even helping with standards for frozen vegetables---and fruits, too.

DIEHL:

Yes, quality control is our latest job. If the industry is to continue to thrive, all frozen products must have a uniformly fine quality and must be produced under sanitary conditions. So growers and packers are joining with the Department on quality standards.

KADDERLY:

Just one last question, Mr. Diehl. Have you discovered any way to freeze apples yet?

DIEHL:

We've just solved a problem in freezing apple slices for the bakery trade. We've learned how to keep those slices from turning brown and tough during freezing.

KADDERLY:

What's the secret?

DIEHL:

It's very simple. We just give the apple slices a steam bath before freezing.

KADDERLY:

Most everything is simple---when you know how. So next time I buy apple pie, I may be profiting from some of your work.

Well, thanks Mr. Diehl, for this very interesting story of what's been going on in the Department's Frozen Pack Laboratory at Seattle.